

In the claims

Please amend the claims as follows:

1. (currently amended) A composition comprising a matrix and a ~~recombinant~~ bidomain protein or peptide having an amino acid sequence that comprises a transglutaminase substrate domain and a bioactive factor, wherein the protein or peptide is covalently bound to the matrix by the transglutaminase substrate domain.
2. (original) The composition of claim 1 wherein the matrix comprises fibrin.
3. (original) The composition of claim 2 wherein the transglutaminase substrate domain is a Factor XIIIa substrate domain.
4. (original) The composition of claim 3 wherein the Factor XIIIa substrate domain comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, and combinations and bioactive fragments thereof.
5. (original) The composition of claim 3 wherein the Factor XIIIa substrate domain comprises an amino acid sequence of SEQ ID NO: 15.
6. (original) The composition of claim 1 wherein the bioactive factor is a peptide.
7. (currently amended) The composition of claim 1 wherein the bioactive factor comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, TGF- β 1, BMP 2, VEGF₁₂₁, PDGF AB, PTH, L1Ig6, and combinations and bioactive fragments thereof.

8. (original) The composition of claim 1 wherein the bioactive factor is a polypeptide growth factor.

9. (original) The composition of claim 8 wherein the bioactive factor is selected from the group consisting of VEGF, a growth factor from the TGF- β superfamily, PDGF, growth hormone, IGF, and ephrin.

10. (currently amended) A method of attaching a bioactive factor to a matrix, comprising

~~recombinantly~~ producing a biodomain peptide or protein comprising a bioactive factor and a transglutaminase substrate domain; and

exposing the matrix to a transglutaminase to covalently couple the biodomain peptide or protein to the matrix and crosslink the matrix.

11. (original) The method of claim 10 wherein the matrix comprises fibrin.

12. ~~13.~~ (currently amended) The method of claim 10 wherein the transglutaminase substrate domain is a Factor XIIIa substrate domain and the transglutaminase is Factor XIIIa.

13. ~~14.~~ (currently amended) The method of claim 12 ~~13~~ wherein the Factor XIIIa substrate comprises an amino acid sequence is selected from the group consisting of SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, and a combination or bioactive peptide fragment thereof.

14. ~~15.~~ (currently amended) The method of claim 13 ~~14~~ wherein the Factor XIIIa substrate comprises an amino acid sequence of SEQ ID NO: 15.

15. ~~16.~~ (currently amended) The method of claim 10 wherein the bioactive factor is a polypeptide growth factor.

16. ~~17.~~ (currently amended) The method of claim 10 wherein the bioactive factor is selected from the group consisting of VEGF, growth factors from the TGF- β superfamily, PDGF, growth hormone, IGF, and ephrin.

17. ~~18.~~ (currently amended) The method of claim 10 wherein the bioactive factor contains an acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, SEQ ID NO:6, TGF- β 1, BMP 2; VEGF₁₂₁, PDGF AB, L1Ig6, and PTH, and a combination or bioactive peptide fragment thereof.

18. (new) A bidomain protein or peptide comprising a transglutaminase substrate domain and a bioactive factor.

19. (new) The bidomain protein or peptide of claim 18 wherein the protein or peptide is a recombinant or synthetic protein or peptide.

20. (new) The bidomain protein or peptide of claim 18 wherein the transglutaminase substrate domain is a Factor XIIIa substrate domain.

21. (new) The bidomain protein or peptide of claim 20 wherein the Factor XIIIa substrate domain comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, and combinations and bioactive fragments thereof.

22. (new) The bidomain protein or peptide of claim 21 wherein the Factor XIIIa substrate domain comprises an amino acid sequence of SEQ ID NO: 15.
23. (new) The bidomain protein or peptide of claim 18 wherein the bioactive factor is a peptide.
24. (new) The bidomain protein or peptide of claim 23 wherein the peptide comprises an amino acid sequence selected from the group of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, and PTH.
25. (new) The bidomain protein or peptide of claim 18 wherein the bioactive factor is a polypeptide growth factor.
26. (new) The bidomain protein or peptide of claim 25 wherein the bioactive factor is selected from the group consisting of VEGF, a growth factor from the TGF- β superfamily, PDGF, growth hormone, IGF, and ephrin.
27. (new) The bidomain protein or peptide of claim 26 wherein the growth factor is selected from the group consisting of TGF- β 1, VEGF₁₂₁, PDGF AB, BMP 2, and L1Ig6.
28. (new) A matrix material for forming a gel comprising
- (i) a bidomain protein or peptide comprising a transglutaminase domain and a bioactive factor,
 - (ii) fibrinogen,
 - (iii) factor XIIIa, and
 - (iv) thrombin.

29. (new) The matrix material of claim 28 wherein the transglutaminase substrate domain is a Factor XIIIa substrate domain.

30. (new) The matrix material of claim 29 wherein the Factor XIIIa substrate domain comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 14, and SEQ ID NO: 15, and combinations and bioactive fragments thereof.

31. (new) The matrix material of claim 28 wherein the bioactive factor is a peptide.

32. (new) The matrix material of claim 31 wherein the peptide comprises an amino acid sequence selected from the group of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, and PTH.

33. (new) The matrix material of claim 28 wherein the bioactive factor is a polypeptide growth factor.

34. (new) The matrix material of claim 33 wherein the bioactive factor is selected from the group consisting of VEGF, a growth factor from the TGF- β superfamily, PDGF, growth hormone, IGF, and ephrin.

35. (new) The matrix material of claim 34 wherein the growth factor is selected from the group consisting of TGF- β 1, VEGF₁₂₁, PDGF AB, BMP 2, and L1Ig6.